



Development of a Dedicated LPG Ultra-Low Emission Vehicle (ULEV)

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1/94-6/96

NREL Subcontract Administrator

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Objective

To develop a dedicated propane vehicle that will meet or exceed the 1998 California ULEV emission standards.

Approach

Use the following technologies to develop a liquefied petroleum gas (LPG) gaseous fuel management system for a 1994 Dodge Intrepid 3.3-liter 60° V6:

- Port propane vapor injection
- High-pressure propane vapor regulation
- 32-bit electronic control module (ECM)
- Air Mass sensing



Propane (LPG) ultra-low emission vehicle

- Specially formulated three-way propane catalytic converters.

Integrate these technologies over four phases of development:

Phase 1	Systems Design
Phase 2	Hardware Assembly and Prototype Testing
Phase 3	Full-Scale Systems Testing and Integration
Phase 4	Vehicle Demonstration

After completing Phase 4 and accruing at least 10,000 miles, we will submit the test vehicle for independent verification of performance in meeting or exceeding the 1998 Ultra-Low Emission Vehicle (ULEV) standards.

Accomplishments

We completed baseline 1994 Federal Test Procedure (FTP) gasoline emissions tests on the vehicle. A limited Prototype LPG gaseous fuel port injection system was installed onto a 1994 3.3l V6 port injected gasoline engine and tested on an engine dynamometer comparing horsepower and torque. Additional air:fuel ratio cylinder-to-cylinder balance testing was also performed, which identified the need for proper port injection timing for the gaseous fuel being injected.



Future Direction

Continue to develop the system to install and operate on the test vehicle by mid-1995. Concurrent to meeting project goals, refine the system for future commercialization.

Publication

Smith, D.A., S. Stromberg, and L. Gettel. 1994. "Dedicated Propane Ultra-Low Emission Vehicle." Presented at the Contractors Coordination Meeting, Detroit, MI. October.

Stromberg, S. et al. 1995. "Hardware Assembly and Prototype Testing for the Development of a LPG Ultra Low Emission Vehicle". Impco Technologies. NREL/TP-425-7618. July.

